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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/736,677

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Yun Bok Lee

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EXAMINER

VANORE, DAVID A

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,677

Applicant(s)

LEE ET AL.

Examiner

David A. Vanore

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 11-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-19 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed October 14, 2005 have been fully considered but they are not persuasive.
2. Applicant has argued at page 6 of the response that the prior art fails to teach the limitations recited in claim 1 where the emitting surface is inclined to be substantially parallel to the substrate.
3. Since the emitting surface is parallel to the substrate, it is inclined to be parallel to the substrate.
4. Applicant argues that claim 7 is allowable for the same reasons as applied to claim 1. Since claim 1 is not allowable, and the remarks not persuasive with respect to claim 1, claim 7 stands rejected.
5. Applicant further argues with respect to claims 14-19 at pages 6-7 of the response that Maishev et al. and Chaudhari et al. fail to teach that the ion beams strike the surface with the incidence angle and energy across the substrate.
6. The configuration of the ion beams generated by the ion sources of Maishev et al. are substantially the same, and the geometry of the beam spread and distance to the substrate are substantially the same. It is therefore reasonable to assume that the beams strike the substrate with quite similar angles of incidence and energy.
7. All claims remain rejected.

Drawings

8. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the embodiment recited in claim 6, and the alignment layer recited in claims 7 and 14 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

9. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

10. Claim 14 is objected to because of the following informalities: The claim recites that the ion beams strike the substrate with the same incidence angle and energy across the substrate. As illustrated in Fig. 5, there is always a nominal fluctuation in the

beam dispersion and energy. The examiner recommends that the word "substantially" be inserted prior to the term "same" in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-5, 8, and 11-13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Maishev et al. (USPN 6,236,163).

13. Regarding claim 1, Maishev et al. teaches an ion implantation device comprising a holder (265), an ion beam path (Note Fig. 5), and an array of ion beam sources (ICH1), where an ion beam is discharged from the source and has a range of incidence angles being greater than zero, as the ion beams IB1 and IB2 have the configuration of a conical tube, as illustrated and disclosed, and where the emitting surface is inclined to be substantially parallel with the substrate.

14. Regarding claim 2, Maishev et al. teaches that a working gas is injected into the chamber, an ionizer breaks down the gas, a discharger discharges the ions as the ion beam, and that an accelerator, in accelerating gaps G1 and G2 for instance, accelerates the beam towards the substrate, Note Col. 8.

15. Regarding claims 3-5, as depicted in Fig. 5, the accelerator slits, ionization, and discharge means are disposed parallel to the substrate.

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16. Regarding claim 8, Maishev et al. teaches the use of argon as an inert gas (Col. 3 Lines 10-11).

17. Regarding claims 11-13, Maishev et al. teaches the irradiation of a substrate where the angle of incidence of an ion beam is between 10-20 degrees, 40-50 degrees, and 40-60 degrees, note Col. 7.

18. Claim 6 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Berkowitz (USPN 4,449,051).

19. Berkowitz teaches an ion beam irradiation system having a substrate on a holding means (Proximate to Item 36 in Fig. 1), an ion beam path traced by ion beam (18) in Fig. 1, and an ion beam source (Depicted as the apparatus to the right of Label 45 in Fig. 1) where the angle of incidence is greater than zero to avoid crystal channeling effects (Col. 1 Lines 38-43), and the emitting surface of the ion beam source depicted as the aperture downstream of Item 42 is substantially parallel to the wafer surface, an ionizer (8) which ionizes an injected gas (6), a discharger (42), and an acceleration means (26), where the acceleration and discharge means are substantially parallel to the substrate, and the ionizer is inclined at an angle different from the acceleration and discharge means.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 7 and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maishev et al. (USPN 6,236,163) in view of Chaudhari et al.
22. Maishev et al. teaches all the required limitations of claims 1 and 15-19 as pointed out above.
23. Maishev et al. fails to teach a substrate having an alignment layer thereon.
24. Chaudhari et al. teaches an ion implantation apparatus where the sample has an alignment layer thereon.
25. Chaudhari et al. modifies the prior art of Maishev et al. to incorporate a substrate into the ion beam irradiation apparatus of Maishev et al. where the substrate has an alignment layer thereon.
26. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an alignment layer on a substrate in an ion beam irradiation apparatus because an alignment layer, or induced anisotropy, on the substrate surface induces the generation of a multidomain structure which increases the viewing angle of liquid crystal display fabricated from the implanted substrate (Note Col. 1 of Chaudhari et al.).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David A Vanore
Patent Examiner
Art Unit 2881

dav